

ABSTRACT

A shock wave in a gas is modified by emitting energy to form an extended path in the gas; heating gas along the path to form a volume of heated gas expanding outwardly from the path; and directing a path. The volume of heated gas passes through the shock wave and modifies the shock wave. This eliminates or reduces a pressure difference between gas on opposite sides of the shock wave. Electromagnetic, microwaves and/or electric discharge can be used to heat the gas along the path. This application has uses in reducing the drag on a body passing through the gas, noise reduction, controlling amount of gas into a propulsion system, and steering a body through the gas. An apparatus is also disclosed.